IBM

Mag Card

Maintenance Analysis Procedures

IBM Mag Card Composer

INTRODUCTION

This Maintenance Analysis Procedures Manual is produced for US and World Trade customer engineers and other service personnel. The purpose of this manual is to assist service personnel in diagnosing failures on the IBM Mag Card Composer.

Service personnel using this manual must have completed the student training course or understand the theory of operation as explained in the service manual Form No. 241-6046-0, which should be used with this manual.

IBM MAG CARD COMPOSER
MAINTENANCE ANALYSIS PROCEDURES
TABLE OF CONTENTS

start of call

map0010

PAGE 1 OF 2

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER

No entries in this table

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	002	6000	A
1	004	6010	A
2	008	6010	A

001
**********START**********

-Discuss the problem or failure symptom with the operator.

-Request a sample and/or any other information about the problem.

-After obtaining the information from the operator, make a visual inspection for obvious defects (loose or broken parts, etc.)

-If the cause of the failure can EASILY be determined and
(Step 001 continues)

(Step 001 continued)
repaired, repair as required and verify the fix.

-Turn the power off and then on.

Do all the motors and fans (printer and card deck motor and printer and power supply fan) run?
Y N
|
| 002
| GO TO MAP 6000, ENTRY POINT A.
|
003
Did the card deck "Click" when power was applied?
Y N
|
| 004
| GO TO MAP 6010, ENTRY POINT A.
|
|
|
|
|
|
|
|
|
|
|
|
|
|

2
A

A start of call

1

map0010

PAGE 2 OF 2

005

-Ensure that the "ENTRY" button is up and that there is not a card in the console.

-Depress several characters.

Did all the characters print?

Y N

006

Is the "Remove Card" message on?

Y N

007

-Check the voltages at the following planar, and the printer DC disconnect connections.

Connector-Pin Number	Voltage
1-12	+24VDC
1-23	+ 9VDC
2-13	+ 5VDC
2-16	- 5VDC
4-03	+ 5VDC
4-22	+ 9VDC
DC-1	+12VDC
DC-2	+ 9VDC
DC-3	+24VDC

(Step 007 continues)

B C

B C

(Step 007 continued)

Are the voltages correct within a 10% tolerance?

Y N

008

GO TO MAP 6010, ENTRY POINT A.

009

-The problem is likely to be in the printer. Go to the Printer Function chart for the last machine operation which occurred, if known. If this is not known, go to the Planar Static Voltage Check.

010

-The card deck is "busy". Go to the Load Function chart for the card deck.

011

-Go to the Quick Check for more information about the problem.

ENTRY POINTS

FROM MAP NUMBER	ENTER THIS MAP: ENTRY POINT	PAGE NUMBER	STEP NUMBER
0010	A	1	001

EXIT POINTS

EXIT THIS MAP: PAGE NUMBER	STEP NUMBER	TO MAP NUMBER	ENTRY POINT
5	037	6010	A

001
(ENTRY POINT A)
**********START**********

- POWER ON.

Does the power supply fan operate?
Y N

002
- POWER OFF.

- Using the CE ohm meter on the lowest OHMS scale, check the MAIN LINE fuse.
(Step 002 continues)

4
A

(Step 002 continued)

Does the meter indicate zero ohms across the fuse?
Y N

003
- Replace the fuse.

- POWER ON.

Does the power supply fan operate?
Y N

004
- POWER OFF.

- Using the CE ohm meter on the lowest OHMS scale, check the MAIN LINE fuse.

Does the meter indicate zero ohms across the fuse?
Y N

4 3 3 2
B C D E

POWER SUPPLY

E
1

POWER SUPPLY START

MAP 6000

PAGE 2 OF 5

005
- Unplug the reader/recorder motor.

- Replace the fuse.

- POWER ON.

Does the power supply fan operate?
Y N

006
- POWER OFF.

- Using the CE ohm meter on the lowest OHMS scale, check the MAIN LINE fuse.

Does the meter indicate zero ohms across the fuse?
Y N

3 3
F G H

H

007
- Unplug the reader/recorder motor cable at the power supply end. (P15)

- Replace the fuse.

- POWER ON.

Does the power supply fan operate?
Y N

008
- POWER OFF.

- Using the CE ohm meter on the lowest OHMS scale, check the MAIN LINE fuse.

Does the meter indicate zero ohms across the fuse?
Y N

3 3
J K L

L

009
- Unplug the line cord.

- Disconnect the power supply fan.

- Replace the fuse.

- Plug in the line cord.

- POWER ON.

- Wait at least one minute, then POWER OFF and recheck the fuse.

Does the meter indicate zero ohms across the fuse?
Y N

010
- Replace the fuse.

- Unplug the AC secondary plugs P4, P5, and P6 from the power supply.

- POWER ON for at least one minute, then POWER OFF.

- Using the CE ohm meter on the
(Step 010 continues)

3
M

(Step 010 continued)
lowest OHMS scale, check the MAIN LINE fuse.

Does the meter indicate zero ohms across the fuse?
Y N

011
- Replace the power supply baseplate assembly.

- Verify the fix.

- Make sure that all components and plugs that were removed or unplugged, are restored.

012
- Replace the power supply Distribution Board.

- Verify the fix.

- Make sure that all components and plugs that were removed or unplugged, are restored.

G J K M
2 2 2 2

013
- Replace the power supply fan assembly.

- Verify the fix.

- Make sure that all components and plugs that were removed or unplugged, are restored.

014
- Return to the ***START*** of THIS MAP.

015
- POWER OFF.

- Repair/replace the reader/recorder motor cable.

016
- Return to the ***START*** of THIS MAP.

C D F
1 1 2

017
- POWER OFF.

- Replace the reader/recorder motor.

- Verify the fix.

- Make sure that all components and plugs that were removed or unplugged, are restored.

018
- Return to the ***START*** of THIS MAP.

019
- A quick change in the line voltage or a defective fuse MAY have been the problem.

- Verify the fix.

- Make sure that all components and plugs that were removed or unplugged, are restored.

020
- POWER ON.

Is 115VAC present at the female side of P-14, pins 1 and 3? (AC input cable plug.)
Y N

021
Is 115VAC present at the female side of the 12 pin AC Adapter cable plug pins 2 and 12?
Y N

022
Is the printer motor operating?
Y N

023
- The problem is in the Printer. Refer to the wiring diagram in the Service Manual to diagnose the failure.

N P Q

N P Q

024
- The problem is in the power cable between the Printer and the console. Refer to the A.C. wiring diagram in the Service Manual to diagnose the failure.

025
- POWER OFF.

- Repair/replace the AC ADAPTER cable.

- Verify the fix.

- Make sure that all components and plugs that were removed or unplugged, are restored.

026
Is 115VAC present on the Barrier Terminal Strip in the power supply between terminals "115" and "COM"?
Y N

R S

A R S

027
- POWER OFF.

- Replace the power supply baseplate assembly.

- Verify the fix.

- Make sure that all components and plugs that were removed or unplugged, are restored.

028
- POWER OFF.

- Replace the power supply fan assembly.

- Verify the fix.

- Make sure that all components and plugs that were removed or unplugged, are restored.

029
Does the reader/recorder motor operate?
Y N

5 5
T U

030
Is 115VAC present at the reader/recorder motor connector?
Y N

031
Is 115VAC present at the power supply end of the reader/recorder motor cable?
Y N

032
- POWER OFF.

- Replace the power supply baseplate assembly.

- Verify the fix.

- Make sure that all components and plugs that were removed or unplugged, are restored.

033
- POWER OFF.

- Repair/replace the reader/recorder motor cable.

- Verify the fix.

- Make sure that all components and plugs that were removed or unplugged, are restored.

034
- POWER OFF.

- Replace the reader/recorder motor.

- Verify the fix.

- Make sure that all components and plugs that were removed or unplugged, are restored.

035
Does the printer fan operate?
Y N

036
- The problem is in the Printer. Refer to the wiring diagram in the Service Manual to diagnose the failure.

037
GO TO MAP 6010, ENTRY POINT A.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0010	A	1	001
6000	A	1	001
6030	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	005	6020	A
4	021	6020	A
4	026	6020	A
6	040	6020	A
8	055	6020	A
3	011	6030	A
3	012	6030	A
8	052	6030	A
9	065	6030	A
10	068	6030	A
3	015	6040	A

001
(ENTRY POINT A)
**********START**********

- POWER OFF for a minimum of 30 seconds.

- POWER ON.
(Step 001 continues)

(Step 001 continued)

Is K1 relay energized?
Y N

002
- POWER OFF.

- Unplug the P9 connector.

- Wait for a minimum of 30 seconds.

- POWER ON.

Is K1 relay energized?
Y N

003
- POWER OFF.

- Check the D.C. fuses, F9, F10, F11, F12, F13, and F16 using the lowest OHM scale on the CE Meter.

Were any of the fuses found to be defective?
Y N

004
- POWER ON.

- Is +24VDC present on fuse F9?
Y N

005
GO TO MAP 6020, ENTRY POINT A.

006
- POWER OFF.

- Jumper P2-15 (or TP-1) to FRAME ground.

- NOTE: In late level machines, this point is brought out to a point on the regulator board where it can be reached without removing the power supply from the machine, and is marked "TP-1". On early level machines, it will be necessary to POWER the machine OFF, remove the power supply far enough to be able to attach a jumper lead to P2-15, and then power ON the machine with the power supply still out of the machine. Be VERY CAREFUL not

(Step 006 continues)

(Step 006 continued)
to allow a short to occur between P2-15 and P2-14 or any other point.

- POWER ON.

Is K1 relay energized?
Y N

007
- POWER OFF.

- It WILL be necessary at this time, to remove the power supply from the machine, far enough to reach P2-14.

- Using the proper OHM scale, measure the resistance between fuse F9, and connector P2-14.

Does the resistance measure between 400 and 600 Ohms?
Y N

008
- Replace the Distribution Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

009
- Replace the Regulator Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

010
- After ensuring that the jumper to keep the K1 relay energized is still in place, Return to the ***START*** of THIS MAP.

011
- POWER OFF.
GO TO MAP 6030, ENTRY POINT A.

012
- POWER OFF.
GO TO MAP 6030, ENTRY POINT A.

013
- Using the following table, check all the voltages on P9 with reference to FRAME ground.

- Record the results of these checks for later use in the MAPS.

NAME	TOLERANCE	PLUG-PIN
+24V	+23.4 to +27.2	P9-1 P9-15
+12V	+10.8 to +13.6	P9-3
+9V(R)	+8.4 to +9.6	P9-2 P9-6
+5V(R)	+4.9 to	P9-10

(Step 013 continues)

(Step 013 continued)

	+5.5	P9-11
+5V (Sense)	+4.9 to +5.5	P9-4
-12V	-10.7 to -13.6	P10-1
-5V	-4.5 to -5.7	P9-8 P9-12

Are ALL of the voltages present, and within tolerance?
Y N

014
Is ANY voltage missing? (Less than half the expected reading)
Y N

015
GO TO MAP 6040, ENTRY POINT A.

016
- POWER OFF.

- Check the D.C. fuses, F9, F10, F11, F12, F13, and F16 using the lowest OHM scale on the CE Meter.

Were any of the fuses found to be defective?
Y N

017
Is +24VDC present on P9-1, and P9-15?
Y N

018
- Replace the Distribution Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

MAP 6010-3

L
3

POWER SUPPLY

MAP 6010

PAGE 4 OF 11

019
Is +12VDC present on P9-3 ?
Y N

020
Is +12VDC present on fuse F10?
Y N

021
GO TO MAP 6020,
ENTRY POINT A.

022
- Replace the Distribution Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

023
Is +9VDC present on P9-2 **AND** P9-6?
Y N

6
M N

N

024
Is +9VDC present on P9-2 **OR** P9-6?
Y N

025
Is -24VDC present on fuse F12?
Y N

026
GO TO MAP 6020,
ENTRY POINT A.

027
- POWER OFF.

- Using the **LOWEST** ohms scale (or the 2K ohm/diode scale of the CE Digital Meter), measure the resistance between each of the following pins on the P7 connector: (With the connector unplugged.)

RED LEAD (+)	BLACK LEAD (-)
P7-1	P7-2
P7-3	P7-2
P7-1	P7-3

(Step 027 continues)

6
P

(Step 027 continued)
P7-3 -- P7-1
P7-5 -- P7-4
P7-5 -- P7-6
P7-6 -- P7-5
P7-6 -- P7-4

Do ALL the resistances measured indicate infinite resistance?
Y N

028
- Replace the Heat Sink Assembly.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

029
- Using the **LOWEST** ohms scale (or the 2K ohm/diode scale of the CE Digital Meter), measure the resistance between each of the following pins on the P7 connector: (With the connector unplugged.)

RED LEAD (+)	BLACK LEAD (-)
P7-2	P7-1
P7-2	P7-3
P7-4	P7-5
P7-4	P7-6

Do ALL the resistances measured indicate between 15 and 25 OHMS (400-800 ohms on the CE Digital Meter)?
Y N

030
- Replace the Heat Sink Assembly.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

031
Is +24VDC present on connector P1-13?
Y N

032
- Replace the Distribution Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

033
Is +12VDC present on connector P1-11?
Y N

034
- Replace the Distribution Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

035
- The Regulator Board OR the Distribution Board is defective.

- Get BOTH the Regulator and the Distribution Board, but DO NOT replace the Distribution board unless the Regulator Board fails to fix the problem.

- Make sure all connectors are replugged.

(Step 035 continues)

(Step 035 continued)

- Remove any jumpers that were required.

- Verify the fix.

036
- Replace the Distribution Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

037
Is +5VDC present on P9-10 **AND** P9-11?
Y N

038
Is +5VDC present on P9-10 **OR** P9-11?
Y N

039
Is +9VDC present between the fuse F16 (Red + Lead) and D14 Anode? (The Black - Lead can be attached to the exposed screw thread on D14.)
Y N

040
GO TO MAP 6020, ENTRY POINT A.

041
- POWER OFF.

- Using the **LOWEST** ohms scale (or the 2K ohm/diode scale of the CE Digital Meter), measure the resistance between each of the following pins on the P7 connector: (With the connector unplugged.)

RED LEAD (+)	BLACK LEAD (-)
P7-1	P7-2
P7-3	P7-2
P7-1	P7-3
P7-3	P7-1
P7-5	P7-4
P7-5	P7-6

(Step 041 continues)

(Step 041 continued)
P7-6 -- P7-5
P7-6 -- P7-4

Do ALL the resistances measured indicate infinite resistance?
Y N

042
- Replace the Heat Sink Assembly.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

043
- Using the **LOWEST** ohms scale (or the 2K ohm/diode scale of the CE Digital Meter), measure the resistance between each of the following pins on the P7 connector: (With the connector unplugged.)

RED LEAD (+) BLACK LEAD (-)
(Step 043 continues)

(Step 043 continued)

P7-2 --- P7-1
P7-2 --- P7-3
P7-4 --- P7-5
P7-4 --- P7-6

Do ALL the resistances measured indicate between 15 and 25 OHMS (400-800 ohms on the CE Digital Meter)?
Y N

044
- Replace the Heat Sink Assembly.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

X

V X
6

045
- The Regulator Board OR the Distribution Board is defective.

- Get BOTH the Regulator and the Distribution Board, but DO NOT replace the Distribution board unless the Regulator Board fails to fix the problem.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

046
- Replace the Distribution Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

047
Is +5VDC present on P9-4?
Y N

048
- POWER OFF.

- Unplug the P9 connector if it is not unplugged at this time.

- POWER ON.

Is +5VDC present on P9-4?
Y N

049
- POWER OFF.

- Remove the Regulator Board.

- Using the **LOWEST** OHM scale, measure the resistance between P9-4 and FRAME ground.

Does the resistance measured indicate infinite resistance?
Y N

A A
Y Z A B

Z A A
A B

050
- Replace the Distribution Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

051
- Replace the Regulator Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

052
- POWER OFF.
GO TO MAP 6030, ENTRY POINT A.

053
Is -12VDC present on P10-1?
Y N

054
Is -12VDC present on fuse F13?
Y N

055
GO TO MAP 6020, ENTRY POINT A.

056
- Replace the Distribution Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

057
Is -12VDC present on connector P2-9 and P2-10?
Y N

9 9
A A
C D

058
- Replace the Distribution Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

059
Is -5VDC present on P9-8 OR P9-12?
Y N

060
Is -5VDC present on P1-1?
Y N

061
- POWER OFF.

- Unplug the P9 connector.

- POWER ON.
(Step 061 continues)

(Step 061 continued)

Is -5VDC present on P1-1?
Y N

062
Is -24VDC present on P1-15?
Y N

063
- Replace the Distribution Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

064
- The Regulator Board OR the Distribution Board is defective.

- Get BOTH the Regulator and the Distribution Board, but DO NOT replace the Distribution board unless the Regulator Board fails to fix
(Step 064 continues)

(Step 064 continued)
the problem.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

065
GO TO MAP 6030, ENTRY POINT A.

066
- Replace the Distribution Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

POWER SUPPLY

MAP 6010

067
- Replace the Distribution Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

068
- Unplug the P9 connector.
GO TO MAP 6030, ENTRY POINT A.

069
- POWER OFF.

- Using the **LOWEST** OHM scale, measure the resistance between the following points and FRAME GROUND.

P9-5 P9-7 P9-9
P9-14 P1-3
(Step 069 continues)

(Step 069 continued)

Do all of the resistance readings indicate zero ohms?
Y N

070
- Replace the Distribution Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

071
Was it necessary to jumper TP-1 (P2-15) to FRAME ground in a previous step?
Y N

072
Is this MAP being used to diagnose a problem of a missing voltage on the Base Planar power connector?
Y N

1 1
1 1
A A A
H J K

073
- All the diagnostic procedures indicate that the Power Supply is functioning properly at this time. If a problem is still indicated to be in the Power Supply, it may be necessary to use an oscilloscope to ensure that the power supply produces a constant D.C. voltage (no "ripple"). If an oscilloscope is not available, or the problem is a repeat call, it may be necessary to get ALL the modules for the power supply, and replace them in sequence. If this is necessary, the suggested order of replacement is,

- 1. Regulator Card AND Heat Sink Assembly.

- 2. Distribution Board.

- 3. Baseplate Assembly.

074
- POWER OFF.

- Repair the Base Planar Power Cable.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

075
- Replace the Regulator Board.

- Make sure all connectors are replugged.

- Remove any jumpers that were required.

- Verify the fix.

MAP 6020

Power Supply A.C. Checks

PAGE 1 OF 2

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
6010	A	1	001

001
(ENTRY POINT A)
**********START**********

- POWER OFF.

- Unplug P9 .

- Remove the power supply from the machine.

- Unplug P4, P5, and P6.

- POWER ON.

- Check the A.C. output from the transformer secondary windings for the following voltages:

P4-1 to P4-2 = 13VAC
(Step 001 continues)

(Step 001 continued)
P4-2 to P4-3 = 13VAC
P4-1 to P4-3 = 26VAC

P5-1 to P5-2 = 13VAC
P5-2 to P5-3 = 13VAC
P5-1 to P5-3 = 26VAC

P6-1 to P6-2 = 10VAC
P6-2 to P6-3 = 10VAC
P6-1 to P6-3 = 20VAC

- The above voltages should be within the following tolerances.

10VAC plus or minus 1.5VAC
13VAC plus or minus 2.0VAC
20VAC plus or minus 3.0VAC
26VAC plus or minus 4.0VAC

Are any of the voltages missing or out of tolerance?
Y N

2
A B

B MAP 6020-1

002
- POWER OFF.

- Replug P4, P5, and P6.

- Remove the AC fuses, F1, F2, F3, F4, F7, and F8, one at a time, and using the lowest OHM scale, check each fuse.

Were any of the fuses found to be defective?
Y N

003
- Replace the Distribution Board.

- Verify the fix.

004
- Replace the defective fuse(s).

- POWER ON.

- Wait at least one minute.

- POWER OFF.

- using the lowest OHM scale,
(Step 004 continues)

A
1

MAP 6020

Power Supply A.C.

PAGE 2 OF 2

(Step 004 continued)
check each of the fuses that were replaced in the previous step.

Were any of the fuses found to be defective?
Y N

005
- Verify the fix.

006
- Replace the Distribution Board.

- Verify the fix.

007
- Replace the Baseplate Assembly.

- Verify the fix.

POWER SUPPLY

POWER SUPPLY

MAP 6030

PAGE 1 OF 4

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
6010	A	1	001
6040	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	005	6010	A
3	018	6010	A

001
(ENTRY POINT A)
**********START**********

- Unplug the cable connectors from the Base Planar.

- Replace any fuses that may have been found defective.

- POWER ON.

Is K1 relay energized?
Y N

2
A B

B

MAP 6030-1

002
- Turn POWER OFF for at least 30 seconds.

- Remove the Regulator Board.

- Unplug the Heat Sink (P7).

- Using the lowest OHM scale, check each of the fuses that were replaced in the previous step, and replace any defective fuses.

- POWER ON for at least one minute.

- Turn POWER OFF for at least 30 seconds.

- Recheck the same fuse(s).

Are any of the fuses defective?
Y N

2 2
C D

003
- Replug the Heat Sink (P7).

- POWER ON for at least one minute.

- Turn POWER OFF for at least 30 seconds.

- Recheck the same fuse(s).

Are any of the fuses defective?
Y N

004
- Restore the Regulator Board to the power supply.

- POWER ON for at least one minute.

- Turn POWER OFF for at least 30 seconds.

- Recheck the same fuse(s).

Are any of the fuses defective?
Y N

E F G

A C E F G
1 1

005
GO TO MAP 6010, ENTRY POINT A.

006
- Replace the Regulator board.

- Verify the fix.

007
- Replace the Heat Sink Assembly.

- Verify the fix.

008
- Replace the Distribution Board.

- Verify the fix.

009
Wait 30 seconds and turn power off. Is the same D.C. fuse defective again?
Y N

3
H J

J MAP 6030-2

010
- Turn POWER OFF for at least 30 seconds.

- Replug P9.

- POWER ON.

Did the problem return?
Y N

011
- Turn POWER OFF for at least 30 seconds.

- Replug the cable connectors to the Base Planar.

- POWER ON.

Did the problem return?
Y N

012
- Verify the fix.

3 3
K L

POWER SUPPLY

013
- The problem is a short in the Planar, the Reader/Recorder Deck, or the Printer. Go to the wiring diagram in the Service Manual to diagnose the failure.

014
- Repair the Planar Power Cable.

- Replace any defective fuses.

- Verify the fix.

015
- Turn POWER OFF for at least 30 seconds.

- Remove the Regulator Board.

- Unplug the Heat Sink (P7).

- Using the lowest OHM scale, check each of the fuses that were replaced in the previous step, and replace any defective fuses.

(Step 015 continues)

(Step 015 continued)

- POWER ON for at least one minute.

- Turn POWER OFF for at least 30 seconds.

- Recheck the same fuse(s).

Are any of the fuses defective?
Y N

016
- Replug the Heat Sink (P7).

- POWER ON for at least one minute.

- Turn POWER OFF for at least 30 seconds.

- Recheck the same fuse(s).

Are any of the fuses defective?
Y N

017
- Restore the Regulator Board to the power supply.

- POWER ON for at least one minute.

- Turn POWER OFF for at least 30 seconds.

- Recheck the same fuse(s).

Are any of the fuses defective?
Y N

018
GO TO MAP 6010, ENTRY POINT A.

019
- Replace the Regulator board.

- Verify the fix.

020
- Replace the Heat Sink Assembly.

- Verify the fix.

021
- Replace the Distribution Board.

- Verify the fix.

ENTRY POINTS

FROM MAP NUMBER	ENTER THIS MAP: ENTRY POINT	PAGE NUMBER	STEP NUMBER
6010	A	1	001

EXIT POINTS

EXIT THIS MAP: PAGE NUMBER	STEP NUMBER	TO: MAP NUMBER	ENTRY POINT
3	014	6030	A
4	019	6030	A

001
(ENTRY POINT A)
**********START**********

- Check fuses F9, F10, F11, F12, F13 and F16.

Were any fuses found to be defective?
Y N

002
Is +24VDC, +12VDC, or -12VDC out of tolerance?
Y N

4 3
A B C

C MAP 6040-1

003
Is the +9VDC or +5VDC out of tolerance?
Y N

004
- POWER OFF

- Replace the Regulator Board.

- Make sure that all components and plugs that were removed or unplugged, are restored.

- Verify the fix.

005
- POWER OFF

- Remove the Regulator Board.

- Unplug the Heat Sink Assembly (P7).

- Using the **LOWEST** OHM scale (or the 2K ohm/diode scale of the CE Digital Meter), measure the resistance between each of the following pins on the P7 connector: (With the connector

(Step 005 continues)

POWER SUPPLY

(Step 005 continued)
unplugged)

RED LEAD (+)	BLACK LEAD (-)
P7-1	P7-2
P7-3	P7-2
P7-1	P7-3
P7-3	P7-1
P7-5	P7-4
P7-5	P7-6
P7-6	P7-5
P7-6	P7-4

Do all the resistances measured indicate infinite resistance?
Y N

006
- Replace the Heat Sink Assembly.

- Make sure that all components and plugs that were removed or unplugged, are restored.

- Verify the fix.

007
- Using the **LOWEST** OHM scale (or the 2K ohm/diode scale of the CE Digital Meter), measure the resistance between each of the following pins on the P7 connector: (With the connector unplugged)

RED LEAD (+)	BLACK LEAD (-)
P7-2	P7-1
P7-2	P7-3
P7-4	P7-5
P7-4	P7-6

Do all the resistances measured indicate between 15 and 25 OHMS (400-800 ohms on the CE Digital meter)?
Y N

008
- Replace the Heat Sink Assembly.

- Make sure that all components and plugs that were removed or unplugged, are restored.

- Verify the fix.

009
- Replug P7 and restore the Regulator Board.

- POWER ON.

Is the +5VDC Sense (P9-4) within tolerance?
Y N

010
- POWER OFF

- Unplug the P9 and P10 connectors.

- Wait at least 30 seconds.

- POWER ON.
(Step 010 continues)

(Step 010 continued)

Is the +5VDC Sense (P9-4) within tolerance?
Y N

011
- POWER OFF

- Remove the Regulator Board.

- Using the **LOWEST** OHM scale, measure the resistance between P1-5 and FRAME ground.

Does the resistance measured indicate infinite resistance?
Y N

012
- Replace the Distribution Board.

- Make sure that all components and plugs that were removed or unplugged, are restored.

- Verify the fix.

013
- Replace the Regulator Board.

- Make sure that all components and plugs that were removed or unplugged, are restored.

- Verify the fix.

014
GO TO MAP 6030, ENTRY POINT A.

015
- POWER OFF

- The Regulator Board OR the Distribution Board is defective.

- Get both the Regulator Board AND the Distribution Board, But DO NOT replace the Distribution Board unless the Regulator Board fails to fix the problem.

- Make sure that all components and plugs that were removed or unplugged, are restored.

(Step 015 continues)

(Step 015 continued)

- Verify the fix.

016
- POWER OFF

- Remove the Power Supply from the machine.

- Wait at least 30 seconds.

- POWER ON.

- Check the A.C. output from the transformer secondary windings for the following voltages:

P4-1 to P4-2 = 11.0 to 15.0VAC
P4-2 to P4-3 = 11.0 to 15.0VAC
P4-1 to P4-3 = 22.0 to 30.0VAC

P5-1 to P5-2 = 11.0 to 15.0VAC
P5-2 to P5-3 = 11.0 to 15.0VAC
P5-1 to P5-3 = 22.0 to 30.0VAC

P6-1 to P6-2 = 8.5 to 11.5VAC
P6-2 to P6-3 = 8.5 to 11.5VAC
P6-1 to P6-3 = 17.0 to 23.0VAC
(Step 016 continues)

(Step 016 continued)

Are any voltages missing or out of tolerance?

Y N

|

| 017

| - POWER OFF

|

| - Replace the Distribution Board.

|

| - Make sure that all components and plugs that were removed or unplugged, are restored.

|

| - Verify the fix.

|

018

- POWER OFF

- Replace the Baseplate Assembly.

- Make sure that all components and plugs that were removed or unplugged, are restored.

- Verify the fix.

A

1

|

|

|

|

019

GO TO MAP 6030, ENTRY POINT A.

International Business Machines Corporation
Office Products Division
Customer Engineering

Form No. 241-6047-0

Printed In USA February,1978